NEWSLETTER

VOLUME 16 NUMBER 3

SUMMER 1979

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AUSTRALIAN SOCIETY FOR LIMNOLOGY

NEWSLETTER

VOLUME 16 NUMBER 3 SUMMER 1979

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THE AUSTRALIAN SOCIETY FOR LIMNOLOGY

The Australian Society for Limnology is an association of over 300 people with professional or amateur interests relating to Australian inland waters. Since its inception in 1961 the Society has played an important role in fostering limnological work in this country. The ASL promotes liaison between limnologists in academic, private and governmental institutions, and has a vested interest in the conservation of aquatic and related resources. Annual congresses are held near centres of limnological interest, and the programme includes scientific sessions, field excursions, and social activities.

The ASL produces a Newsletter, with notes on activities, articles of general interest, book reviews, and congress announcements, and an occasional Special Publication. A further periodical publication is the Directory of Australian Limnologists.

Membership applications are welcomed; four classes of subscribing membership are catered for:

- Ordinary members ($8.00 p.a.)
- Student members ($4.00 p.a.)
- Institutional members ($5.00 p.a.)
- Sustaining members ($50 p.a. or more)
- Affiliated bodies (subs on application)

NOTE: Members are entitled to receive the Aust. J. Mar. Freshwat. Res. at a reduced rate ($7.50).

Subscriptions cover the period 1 July-30 June.

Details are available from:

I. Campbell Esq.
Hon. Sec./Treasurer, A.S.L.,
Department of Chemistry
Caulfield Institute of Technology
P.O. Box 197
Caulfield East, Victoria 3145

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Newsletter contributions are always welcome, and correspondence should be addressed to the Newsletter editor. The deadline for the next issue is 30 June 1979.

ASL EXECUTIVE 1978-1979

President:

Dr I.A.E. Bayly

Vice President:

Dr B.T. Hart

Secretary/Treasurer:

Mr I. Campbell

Committee:

Mr J. Bell
Mr J. Blyth
Ms A. Fletcher
Mr B. Harasymiw
Dr P.S. Lake
Dr L. Llewellyn
Mr B. Mitchell
Ms J. Powling

Newsletter editor:

Dr P.S. Lake
Department of Zoology
Monash University
Clayton
Victoria 3168

NEWS AND ANNOUNCEMENTS

MATERIAL FOR THE NEWSLETTER

The success of the Newsletter depends very largely on the supply of suitable material for the editor. Thus members of ASL are urged to send to the editor any items they deem suitable for publication in the Newsletter. If there is doubt as to the suitability of any item, please forward the item and let the editor decide.

Items for the Newsletter sought from members include:

- news items
- brief summaries of limnological activities
- announcements of conferences
- reports of meetings, seminars or conferences
- book reviews
- announcements of publications
- requests for biological material or limnological assistance

AUSTRALIAN SOCIETY FOR LIMNOLOGY - ANNUAL CONFERENCE 1979

The annual conference of the Australian Society for Limnology will be held at Tallangatta, Victoria, from 18-21 May 1979. The venue of the conference is a compact town by the shores of Lake Hume. Motel and hotel accommodation has been booked and excellent camping and caravan facilities are available. The business of the conference will take place in the newly completed Tallangatta Sports Centre. The scientific business of the conference will be in two parts; one part devoted to the presentation of general papers and the other devoted to a symposium on the management of impounded waters (dammed waters).

After the Annual General Meeting on Sunday afternoon, a barbecuing excursion to Dartmouth Dam is planned.

Topics of Papers for the Symposium include things to consider prior to dam construction, hydrology of reservoirs, features of Lake Hume and Mulwala recreational use of large impoundments, trout pollution and urban lakes.

In the near future, if not already, precise details of the Conference will be mailed to you so that you can register, obtain accommodation, and possibly arrange to give a paper. For details of the Conference, contact:

Ian Campbell, Hon. Sec./Treasurer, A.S.L.
Department of Chemistry, Caulfield Institute of Technology
P.O. Box 197, Caulfield East, Victoria 3145.

Recently a guide on how to be a successful conference participant was brought to the editor's attention. Many A.S.L. members are past masters of many of the points discussed in the guide but some members may be interested in learning some new tricks, for example:

/Making

"Making your name 'stick' - a useful way of ensuring that everyone remembers your name is to arrange for your friend to send telegrams and ring the conference office, several times daily, with messages for the chairman to read out. Particularly effective announcements are 'Will Mr ... please ring a Mr Fraser on Canberra 733200, when he has a free moment?' and 'Major Smedhurst has arranged for Mr ... to visit Government House for dinner and a car will be available at 7.30.'; OR

"Friendly contacts are the very essence of a learned gathering, and you should use this unique opportunity to become familiar with famous and distinguished guests. You will find them surprisingly keen to buy you a drink, help you with your application for a research grant, discuss any psychological problems you may have, or lend you money. These important contacts are easiest made away from the formal atmosphere of the lecture room, however. Best to approach your man, if you happen to see him having dinner with his wife or friends, for example, or meet him going to the lavatory. Relationships forged in this way can have a profound effect on your career. "

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Bulletin of the Australian Society for Limnology

ANNOUNCEMENT OF PUBLICATION

Request for papers

The Executive Committee of A.S.L. has decided to revive publication of the Bulletin of the Australian Society for Limnology.

The Bulletin will publish refereed papers on subjects relating to Australian limnology. The requirements for intending authors to follow are identical with the 'Notice to Authors' of the C.S.I.R.O. journal "Australian Journal of Marine and Freshwater Research".

Papers for possible publication should be sent to:

Dr I.A.E. Bayly
Department of Zoology
Monash University
Clayton, Victoria 3168, Australia

ADDRESS CHANGE

PLEASE NOTE THAT as from 1 September 1978

Dr R. M. McDowall's address is
Fisheries Research Division
Ministry for Agriculture and Fisheries
Private Bag, Christchurch, New Zealand
Tel. 488902

THE FRANKLIN RIVER

Following on from the plea by your editor in the essay "On the Conservation of Rivers in Australia" to conserve the Franklin River in Tasmania as a wild river. Readers may be interested in the vivid articles on this river and its hinterland in the January 1979 issue of "Australian Outdoors". Their "Franklin River special" has four articles of interest:

The last wild river, under threat
A legend in the making
Ride a wild river
Frenchman's Cap, pivot of the Franklin

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DAM 754 CONTOUR

A technical report of the N.S.W. State Fisheries entitled "Dam 754 Contour" is now available. The extensive report consists of longitudinal cross sections of eight major irrigation storages in central and western N.S.W. showing contours (isopleths) of single parameters. The storages investigated are Blowering Dam, Burrinjuck Dam, Wyangala Dam, Carcoar Dam, Burrendong Dam, Keepit Dam, Copeton Dam and Pindari Dam while the parameters measured are temperature, dissolved oxygen (mg/litre and % sat.,) conductance at 25°C, suspended solids, pH, ammonia nitrogen, nitrite nitrogen, oxidized nitrogen, reactive phosphorus, total soluble phosphorus, reactive silica and chlorophyll. The report is made up of thirteen separately bound sets each covering a single parameter. Interested people may obtain the report or the separate section covering the parameters that they are interested in by writing to

E. A. Scribner,
N.S.W. State Fisheries,
P.O. Box N211,
Grosvenor Street,
SYDNEY, N.S.W. 2000.

FAUNA OF TASMANIA PUBLICATIONS

The first handbook of the series Fauna of Tasmania has been published. It is the handbook Tasmanian Odonata by Piers Allbrook. (See review in this Newsletter). The second handbook "Tasmanian Bird Atlas" by David Thomas will also be available shortly. As well as producing handbooks, posters of notable Tasmanian animals are being produced. Posters include

Tasmanian Frogs

No. 1, Litoria raniformis
No. 2. Litoria burrowsi
No. 3. Litoria ewingi

Tasmanian Dragonflies and Damselflies:

No. 4. Synthemiopsis gomphomacromioides
No. 5. Austrolestes annulosus
No. 6. Autroaeschna longissima

The posters cost 50 cents each. For orders up to three posters please add 50 cents; for orders of 4 to 6 posters add $1.00, for orders of 7 to 9 posters add $1.50. Orders should be sent to the address below.

The Fauna of Tasmania Office,
University of Tasmania,
Box 252C, G.P.O.,
Hobart, Tasmania 7001,
Australia.

ARRIVALS

Dr. Tim Berra (of Trout Cod fame) from Ohio State University is in Victoria for 1979 as an American-Australian Education Fellow (Fulbright). As a member of the Department of Zoology, Monash University, he is engaged on research on the Australian Grayling Prototroctes maraera. So far his strenuous efforts in the field appear to be producing results.

The highly promising Survey Section of the National Museum of Victoria has embarked on a project on the macroinvertebrates of the Latrobe River. To assist this project, Richard Norris and Phil Suter have joined the staff. Richard comes from the Zoology Department, Hobart, and has recently finished writing his Ph.D. thesis on the ecological effects of mine effluents on the South Esk River (North-East Tasmania), while Phil comes to the Museum from the Zoology Department, University of Adelaide where, for his Ph.D., he has investigated the biology of South Australian Ephemeroptera.

Mr. Ivor Lansbury of the Hope Department of Entomology, University Museum, Oxford, is coming to Australia to collect and identify aquatic Hemiptera. He will be in Victoria from late March to early April when he will go to Adelaide

AUSTRALIAN LIMNOLOGICAL PUBLICATIONS IN PRESS

The proceedings of a Symposium entitled "Aquatic Research in Southern Queensland" are now being printed. The papers of the 1977 Symposium have been edited by Professor W.D. Williams. The preparation of the papers for printing has been undertaken by the A.S.L. Publications Committee and the Hon. Sec./Treasurer. Hopefully this A.S.L. Special Publication No. 3 will be available for distribution by the time of the Annual Conference.

The sixth edition of the Australian Society for Limnology's Membership Directory will be available shortly (by the time of the Tallangatta Conference.

Incidentally for those with long memories, the Proceedings of the Australian Water Resources Council Symposium on Biology and Microbiology of Water (held in Canberra in August 1977) will be available in the near future.

PIE IN THE SKY SEGMENT

It is interesting to note that a governmentally supported, central limnological organization, The Freshwater Biological Association (of U.K.) is running, at the River Laboratory, Wareham, Dorset, a specialist course on Identification of Aquatic Invertebrates (23-27 April, 1979).

The course is intended to help people faced with problems of identifying the invertebrates of rivers "and should be of interest to research students, water authority biologists, and others concerned with river faunas". "The principles of taxonomy will be discussed and the course will concentrate on the practical problems of identifying species in certain groups. Applicants will be asked to indicate the groups that are of most interest to them and this information will determine which ones are included in the course".

In Australia we have a long way to go. The invertebrates of rivers seem to be those things that require listing (at the level of order) in Tables in the appendages of either E.I.S.'s or pollution surveys.

INVENTORY OF WATER RESOURCES RESEARCH IN AUSTRALIA 1979

Requests for entries for the 1979 edition of the Inventory were mailed out in late January. Approximately 320 addresses have been identified in Australia as water research institutions.

...oOo...

Members of the Society will be saddened to hear of the death of Roger Barker in Melbourne on 7 February 1979 following severe injuries received in a fall sustained on Macquarie Island. Roger was actually engaged in research with the Antarctic Division both before and at the time of his accident. Members of the Society will recall the paper he gave at the 1977 A.S.L. Annual Conference at Lismore. This dealt with the chemistry of Deep Lake - a highly saline lake located in the Vestfold Hills, Antarctica. Roger was a versatile scientist; at the time of his accident he was investigating the biology of the White Mantled Albatross. His enthusiasm for and dedication to Antarctic biology and limnology will be sadly missed.

A.S.L. SPECIAL PUBLICATIONS

LETTER FROM DR. I.D. HISCOCK

The President of the Society has received a letter from Dr. I.D. Hiscock concerning the production of A.S.L. Special Publication No. 2 (Annotated key to the stonefly nymphs (Plecoptera) of Victoria) in relation to his former position of Special Publications Editor for the Society. His letter suggested that his comments be disseminated via the Newsletter.

The salient points made in Dr. Hiscock's letter are as follows:

(1) In Newsletter Vol. 15, No. 3, on page 2, under the heading "A.S.L. Executive 1977-1978", Dr. Hiscock is listed as "Special Publications Editor".

(2) In Newsletter Vol. 16, No. 1, on page 12, under "Minutes of the 4th Executive Committee Meeting" (held before the 17th A.G.M., i.e. when Dr. Hiscock was still Special Publications Editor), it was noted that copies of the recently published plecopteran key were circulated among the Executive.

(3) Dr. Hiscock stated, "I am anxious that all members of the Society should know that even though at the time of publication of the Plecoptera key I was the Society's Special Publications Editor, I knew nothing of this document. My anxiety is based mainly on the possibility that any member might think that I would have had anything to do with an important publication and commit the cardinal sin of omitting its publication date."

A.S.L. SPECIAL PUBLICATION NO. 2

As noted in the above item, no date of publication appears on this work. This fact was considered by the present Executive at its last meeting. It was decided that the situation was not properly recoverable by the circulation of a subsequent document (e.g. a "stick-in" corrigendum), and, officially at least, the publication would have to be referred to as "Hynes (undated)". Nevertheless, A.S.L. Special Publication No. 3 (Aquatic Research in Southern Queensland) will include full details, including date of publication, of A.S.L. Special Publications Nos. 1 and 2.

Members of the Society may be interested to know that Special Publication No.3 will be published within a month or two.

CONFERENCES

AUSTRALIAN SOCIETY FOR LIMNOLOGY, 18TH ANNUAL CONFERENCE, TALLANGATTA, VICTORIA, 18-21 MAY, 1979.

For information see page 1 in the News Section. The venue is in a most pleasant part of Victoria with many limnological attractions. There is a half-day symposium on "Damned Waters", a fine and ample selection of beverages, and an excursion to Dartmouth dam. Hopefully the conference will be well attended.

XIII INTERNATIONAL BOTANICAL CONGRESS SYDNEY, AUSTRALIA, 21-28 AUGUST 1981.

Section 10. Marine and Freshwater Botany

(Chairman Section 10 Committee - Professor H.B.S. Womersley, Department of Botany, University of Adelaide, South Australia 5000).

The section will meet throughout the Congress, and will give the opportunity for symposium and paper sessions on a variety of phycological topics as well as on seagrasses and mangroves. It is anticipated that papers to be presented verbally will be selected but that all other papers offered can be tabled as abstracts or full accounts by the authors; poster displays can be arranged.

The following topics have been suggested, and the Committee will welcome comments on these or suggestion for other topics, as well as on the field trips listed below.

New concepts in algal morphology and taxonomy, including ultrastructural and biochemical aspects.
Sexual reproduction in the algae.
Structure and dynamics of algal communities.
Role of algae in tropical reefs.
Antarctic phycology.
Seagrasses and their biology.
Productivity of algae, seagrass and mangrove communities.
Algal biogeography, with emphasis on the southern hemisphere.
Algal utilisation in the southern hemisphere.
Diatom taxonomy and biology.
Taxonomic concepts in blue-green algae.
Fossil algae.

It is hoped that concurrent sessions can be kept to a minimum. Some marine and freshwater sessions may run concurrently, and it is hoped that some sessions can be presented so as to give the majority of phycologists the opportunity to attend.

Proposed field trips include:

1. Pre-congress to the Great Barrier Reef, probably to Heron Island, including also seagrasses and mangroves. Likely duration: 1 week.
2. Post-congress to Melbourne and around the coast to Adelaide, for Australian endemic marine taxa. Likely duration: 8 days.

3. Sydney to Melbourne for freshwater localities. Likely duration: 6 days. (This could be a pre-congress trip).

4. Several 1 day trips will be available on the first weekend of the Congress, including:

   (a) To C.S.I.R.O. Fisheries and Oceanography at Cronulla, with a probable boat trip for seagrass beds etc.

   (b) To Botany Bay, for mangrove, seagrass and algal communities.

   (c) To a coastal rock platform (Long Reef or similar).

   (d) One or more trips to freshwater habitats.

AUSTRALIAN WATER AND WASTEWATER ASSOCIATION. A.W.W.A.
EIGHTH FEDERAL CONVENTION

Date: 12-16 November 1979.
Venue: Gold Coast, Queensland.
Theme: Water - the Indestructible Resource.
For information contact: Conference Secretary, P.O. Box 129, Brisbane Markets, Queensland 4106.

Australian Water and Wastewater Association Summer School, Adelaide 1980.

q The Fourth Australian Water and Wastewater Associaition Summer School will be held at the Flinders University of South Australia, ten km south of the city of Adelaide; between the 4th and 8th February, 1980, with the theme "Water for the 1980's?"

The School will consist of lectures and workshop sessions dealing with fundamentals of the science and technology of the water and wastewater industry.

Sessions at the School will be presented by speakers including,

K.J. Ives, Professor of Public Health Engineering at University College, London.

Dr. B.T. Commins of the Medmenham Laboratory of the Water Research Centre, U.K.

Dr. M.E.U. Taylor of the National Water and Soil Conservation Organization of the Ministry of Works and Development, N.Z.

Further information can be obtained by contacting Dr. J. Cugley, Secretary, A.W.W.A. Summer School Steering Committee on telephone 08-258 1066 or by writing to him at the State Water Laboratories, C/- Private Bag, P.O. Salisbury, 5108, Australia.

WORLD WILDERNESS CONGRESS

The Second World Wilderness Congress will be held in Cairns, Queensland from 9-13th June 1980. The Principal objectives of the Congress are:

To establish a world-wide understanding of the need for wilderness areas. To provide a platform for statesmen, scientists, artists, writers, poets and indigenous people from many parts of the world who have a profound understanding of the wilderness concept.

To enable the general public to understand that industrial and commercial growth must go hand in hand with the setting aside of more wild and natural areas.

To persuade the administrators of all nations that there is inadequate legislation governing the control and establishment of wilderness areas.

For information write to

The Secretariat,
Second World Wilderness Congress,
P.O. Box 102,
Manunda,
Cairns 4870,
Australia.

INTERNATIONAL SYMPOSIUM ON ATHALASSIC (INLAND) SALT LAKES

Place: Adelaide, South Australia, Australia

Venue: University of Adelaide.

Time: Monday, 22 October to Friday, 26 October 1979.

Organizing Chairman: Professor W.D.Williams, Department of Zoology, University of Adelaide, Adelaide, South Australia 5001, Australia (from whom further details may be obtained).

Scope: The symposium will include contributions on physical, chemical, biological and geological topics. However, the main thrust of the symposium is seen as being in the area of biology (ecological, physiological, regional studies, etc.); Estuarine papers will not be included except when the work reported relates in some way to inland salt waters.

Language: English

Programme: 22-26 October 1979 - formal sessions.

27-28 October 1979 - weekend field trip to saline lakes near Adelaide (salt work pans, salt lakes near mouth of Murray River)

29 October-2,3 November 1979 - alternative excursions (a) or (b)

Excursion (a) is an excursion to coastal (but athalassic) salt lakes in south-east South Australia and athalassic lakes of volcanic plains west of Melbourne, Victoria. This excursion will be led by Dr. I.A.E. Bayly, Department of Zoology, Monash University, Clayton, Victoria 3168, Australia, and will finish at Melbourne.

Excursion (b) to Lake Eyre, Yorke Peninsula and Eyre Peninsula salt lake regions will be led by Professor W.D. Williams, Department of Zoology, University of Adelaide, and will terminate in Adelaide.

Costs: It is appreciated that the cost of a return air fare to Australia from Europe, North America (and almost anywhere?) will be high. In an effort to compensate, accommodation and subsistence costs in Australia will be kept to a minimum during the period of the symposium itself, and participants will camp on the excursions (mid-October in south-eastern Australia is usually reasonably warm and dry). No luxuries will be provided. Such registration and excursions fees as may be charged will be minimal and cover only organisational and other costs. Negotiations are in progress with Qantas on the possibility of charter flights.

Publication: It is intended to publish the papers presented. However, all papers for publication will be subject to refereeing. The Dutch firm of Dr. W. Junk have already indicated an interest in publishing proceedings of the symposium.

A second announcement with further details will be sent to all respondents to this announcement.

INTERNATIONAL CONFERENCE - HEAVY METALS IN THE ENVIRONMENT

A major International Conference on the Management and Control of Heavy Metals in the Environment will be held at Imperial College, London, U.K. from 18 to 21 September 1979.

Themes for the conference will cover industrial and domestic waste treatment (including problems associated with sludge treatment and disposal), health effects related to heavy metal toxicity, advances in analytical techniques, sources and distribution of heavy metals in the environment, as well as an appraisal of the problems associated with the presence of heavy metals in their various forms.

Further details may be obtained from the secretariat: CEP Consultants Limited, 14A Henderson Row, Edinburgh EH3 5DH, U.K. (Telephone 031-5572478) or from Dr. R. Perry, Department of Public Health and Water Resources Engineering, Imperial College, London S.W.7, U.K. (Telephone 01-5895111, extension 1330) or Dr. P. Barnes, School of Civil Engineering, University of New South Wales, Kensington 2033, N.S.W. Australia (Telephone 02-6623012 or 02-6623011).

FOURTH INTERNATIONAL SYMPOSIUM ON ENVIRONMENTAL BIOGEOCHEMISTRY

This conference to be held in Canberra from 26-31 August 1979 is being organised by the Australian Academy of Science. Its general theme is "Evolving Ecosystems". The main topics to be discussed are: early development of biochemical systems, development and maintence of atmospheric oxygen and ozone, element transformation in the oxygenic environment, consequences of oxygen depletion, and agricultural and industrial practices and water quality.

For information contact The Conference Secretary, Australian Academy of Science, P.O. Box 783, Canberra City, A.C.T. 2601, Australia.

FRESHWATER BIOLOGICAL ASSOCIATION

Jubilee Symposium: The Life in Time of Lakes.

Venue: University of Lancaster, Lancaster, England.

Date: 16-20 July, 1979.

Provisional Outline Programme

Monday 16 July
Arrive at Lancaster University
17.00 Reception by the F.B.A.

Tuesday 17 July
Morning Session Palaeolimnology
Afternoon Session Events in lakes during the last 50 years
Evening Session Discussion meeting on "The turning point in limnology over the past 50 years"

Wednesday 18 July
Choice of three excursions:
1. A tour of the Cumbrian lakes
2. Tour of lakes and tarns in the Windermere basin
3. Tour of the North-West Authority's installations
Evening Symposium Dinner.

Thursday 19 July
Morning Session Seasonal events in lakes
Afternoon Session Short-term and diurnal events in lakes
Evening Session Discussion meeting on 'Limnology in the next 50 years'.

Friday 20 July
Excursion to the Ferry House to view exhibits of research in progress at the Windermere Laboratory
16.30 End of Symposium. Depart from Windermere Station 16.58 or return first to Lancaster.

Each session will consist of three or four lectures from invited speakers followed by discussion. The speakers will come from present and past FBA staff, and other limnologists from Britain and overseas. The evening sessions will be introduced by an invited speaker but be more informal. It is hoped that the symposium will present and discuss in a stimulating way recent findings and new ideas in freshwater biology.

For information contact:

Dr. T. B. Bagenal,
Windermere Laboratory,
Freshwater Biological Association,
Ambleside,
Cumbria,
England LA22 OLP.

SIL XXI CONGRESS AND AN ASSOCIATED SYMPOSIUM

XXI Congress of International Association of Theoretical and Applied Limnology (SIL)

Date: 24-31 August, 1980.

Venue: Kyoto International Conference, Hell. Kyoto, Japan.

Professor M. Sudzuki is planning a symposium during, before or after the congress for people attending S.I.L. who are interested in the Systematics of Microscopical biota (e.g. particularly animals - Protozoa, Turbellaria, Rotifera, Tardigrada) and/or microscopical biota and water pollution. He hopes to print the papers given at this meeting. Thus Professor Sudzuki would like to know which people are coming to Japan; which of the two suggested topics they are interested in; when would be the most convenient time for a symposium, and will those interested in the symposium be submitting a paper?

Those interested are urged to write to

Professor M. Sudzuki,
Mihon Daigaku,
Biological Laboratory,
OMIYA-SHI, Higashi-Arai,
Saitama-Ken,
Japan.

SHORT NOTICES

1. International symposium - The Agricultural Industry and its Effects on Water Quality at Hamilton, New Zealand from 15-18 May 1979, organised by the New Zealand Committee for Water Pollution Research and the Royal Society of New Zealand. Details from Dr. C.J. Schouten, Water and Soil Division, Ministry of Works and Development, Private Bag, Hamilton, New Zealand.

2. International symposium - Role of Water in Urban Ecology at Amsterdam, Holland, on 27-31 August 1979. Details from Mr. K.C. Plaxton, Secretary, Organising Committee, P.O. Box 330, Amsterdam, Netherlands.

3. World Aquaculture Convention at the Hilton Hotel, New Orleans, Louisiana, U.S.A. on 4-8 March 1980. Jointly sponsored by the World Mariculture Society, the American Fisheries Society Fish Culture Section, U.S. Trout Farmers Association, and the Catfish Farmers of America. Details from Peter Briggs, Convention Chairman, P.O. Box 2451, Little Rock, Arkansas 72203.

AUSTRALIAN SOCIETY FOR LIMNOLOGY

MINUTES of Executive Committee Meeting of A.S.L. held on Saturday, 12 August 1978 at 22 Netherby Avenue, Mulgrave, Victoria 3170. Meeting opened 3 p.m.

Present: I. Bayly (Chairman), J. Blyth, I. Campbell, A. Fletcher B. Harasymiw, B. Hart, P. Lake, J. Powling

Apologies: J. Bell, D. Buckmaster, L. Llewellyn, B. Mitchell

1 Adoption of Agenda

2. Starred items were accepted without discussion

3. Minutes of the Executive Meeting of 22 May 1978 were accepted

4. Matters arising from the Minutes:

4.1. Venue of 18th Congress

A report by I. Bayly and P. Lake on the suitability of Tallangatta as a conference venue was accepted, and it was agreed that Tallangatta was the most suitable venue investigated.

The date for the conference was fixed as 18-21 May 1979, and P. Lake agreed to book all available accommodation at Tallangatta Travelodge Motel, Tallangatta Hotel and Victoria Hotel by telephone. I. Campbell agreed to confirm the bookings in writing and obtain prices. I. Bayly, P. Lake and I. Campbell agreed to act as Conference Organising Committee, with I. Campbell as contact person. The organising committee is to visit Tallangatta during the week beginning 9 April 1979 to make detailed arrangements.

It was agreed that final response from people wishing to attend the conference should be obtained by Friday, 6 April.

Activities suggested as a part of the conference were a BBQ and a bus trip to Dartmouth Dam on Sunday afternoon, and optional boat trip on Dartmouth on the Monday. I. Campbell to check on buses.

4.2. Half-day Symposium at 18th Congress

B. Hart and J. Powling recommended the idea of a symposium around the theme of man and fresh water. The title "Damned Water" was accepted. It was agreed that the symposium should have four speakers, each speaking for ten minutes to a paper circulated previously, allowing plenty of time for discussion. It was agreed that the papers, and an edited account of the discussion, should be published by the Society. A good public address system and multiple roving microphones would be needed, and it was suggested that C. Barnham be approached.

Possible topic areas of papers to be invited included:

Recreational capacity of Lake Eildon
Closed catchments for water supply
Trout pollution
Water as a population limiting factor
Urban lakes
Environmental implications of large dams

B. Hart and J. Powling agreed to continue the organisation of the symposium and to begin approaching speakers.

/4.3.

4.3. Publications Sub-Committee Report - the following report was accepted:

"Recommendations of the Sub-committee Established to Consider the Feasibility of Revival of the A.S.L. Bulletin

I. Campbell reported that the CIT Publications Section had quoted a price less than $1,500 to produce 1,000 copies of a Bulletin comparable with Bulletin No. 5.

In view of this, and the current financial status of the Society, the committee agreed that the Society could afford to revive the Bulletin. The committee suggests that individual members could be charged an additional $2.00 per year, and institutions an additional $2.50 per year, to cover the additional costs.

It is suggested that the revived Bulletin accept scientific papers (including short notes), but not abstracts or titles, on any aspect of limnology. Contributions would be refereed and a small committee (of about 3) could be established to function as an editorial board. It is also suggested that the Newsletter remain a publication, but ceases to be a scientific publication.

The Newsletter should contain the following types of material: material related to Society operations; minutes; news; abstracts and titles of conference papers, theses, etc.; texts of lectures, presidential addresses and essays not intended to be scientific papers.

The Committee did not think it possible to define a rigid editorial policy for the Newsletter, but suggests that an indication of intent, listing the types of material which the Society believes should be published in the Newsletter, can be drawn up and published in each issue of the Newsletter. Decisions on individual items would then be left to the discretion of the Editor."

4.4. I. Bayly reported that he had written to Nola Lake informing her of the Jolly Award to John Lake, and inviting her to select a book as has been past practice. I. Campbell agreed to send a cheque to cover the purchase price of the book selected and a Jolly Award bookplate to Nola since she had already selected and purchased a book. I. Bayly reported that he was still investigating the cost of a suitable gift.

4.5. I. Campbell reported that the figures for the proposed special publication on Diatoms will not be ready until the middle of next year. The MS will then be forwarded to the Society for consideration as a Special Publication.

4.6. I. Campbell had written to R. Grandeson requesting that he establish an education subcommittee but as yet had received no reply.

4.7. A letter of support for the project on Australian grayling proposed by J. Bell had been sent by the Secretary to D. McMichael and acknowledged.

4.8. J. Bell will present the proposed constitutional changes at the next Executive Meeting.

4.9. A three-drawer filing cabinet had been purchased by the Secretary/Treasurer at a cost of $54.69 to house Society papers.

4.10. An unused Minute Book previously acquired by the Society has been unearthed and copies of past minutes will be inserted.

4.11. J. Bell has not informed the Secretary as to whether or not he has yet approached Stuart Rowlings concerning the A.S.L. Library.

/4.12.

4.13. This item was taken together with item 7.3.

4.13. A cheque for $50.00 was paid to N.S.W. National Parks Service for use of facilities at Kinchega.

4.14. Letters sent to both the Director of N.S.W. National Parks Service and N.S.W. State Fisheries, thanking them for their cooperation and the cooperation of their staff members in the organisation and running of the 17th Conference, were tabled.

5. Correspondence - was tabled.

6. Publication of Symposium on Aquatic Research in Queensland - it was agreed to obtain a quote from the CIT Publications Section and to proceed with printing, after the manuscript was approved by the Editorial Board, if the printing costs were less than $1,200.

7. Composition and rotation of ASL Committees

7.1. The Editorial Board - J. Powling, I. Bayly and P. Lake were elected.

7.2. Status of Newsletter editor - on reference to the Constitution it was noted that the position of Newsletter editor is quite independent of the Editorial Board.

7.3. Jolly Award Committee - I. Campbell reported that he was unable to find any minute or reference to the structure or rotation of the selection committee apart from one which referred to "past practices". It was resolved that this Executive Committee recommends to future Executive Committees that:

> 'The Jolly Award Selection Committee should consist of the three most recent available Jolly Award recipients. Where three recipients are not available, the Executive Committee should nominate the required number of additional members. The longest standing member of the Selection Committee should retire as a new member is appointed. The longest standing member of the Selection Committee at any time shall act as Chairman.'

In view of this it was resolved that I. Campbell should write to D. Lynch and J. Wharton asking them to decide between them whom should retire from the committee; and to W.D. Williams inviting him to join the Committee. It was further resolved that I. Campbell should write to the retiring member on behalf of the Executive Committee thanking him for his service.

It was resolved that nominations for the Jolly Award should remain valid for ten years after submission.

8. Production of Newsletter - P. Lake reported that the Newsletter had been produced and was ready for mailing but that collating problems had been encountered at Monash. B. Hart agreed to check whether or not collating could be carried out at CIT.

9. The date for the next meeting was set for 18 November 1978 and the date for the 4th meeting tentatively for 24 February 1979.

10. Other business.

/10.1.

10.1. Treasurer's Report - B. Hart presented the following financial statement for the 17th Congress:

Income	81 members	(@ $60.00 each)	$4,860.00
	7 children	(@ $25.40 each)	215.00 (? - ed.)
	Refund of marquee hire		100.00
			$5,175.00

Expenditure

Catering (West Darling Tours)	$3,950.00
Drinks	483.00
Bus	70.00
Marquee (S. Walder & Co.)	308.08
Conference facilities (Nat. Parks & Wildlife)	50.00
Hire of chairs (Menindee Church of England)	10.00
(Mr R. Looney)	10.00
Soft drinks	78.48
Incidentals	44.22
Refunds (Conrick $45.00, St Clair $45.00, Rogan $45.00)	135.00
	$5,128.78
Surplus:	36.22

The report was received with acclaim for the excellent budgetting

B. Hart also reported on the Society's current (end of July 1978) financial status as follows:

General Account balance	$4,199.93
Publications Account balance	2,169.43

Since May 1978 there had been five resignations (three individual and two institutional) and 11 new members.

10.2. B. Hart suggested that the Society should take steps to publicise itself and attract new members. A. Fletcher agreed to undertake writing of a small brochure describing the functions of the Society, and to investigate the possibility of writing a short publicity article for publication in circulars such as Lab. Talk, Water and the Aquarists' Newsletter. A budget of $300.00 was allocated for production of the brochures.

11. Meeting closed at 6.10 p.m.

AUSTRALIAN SOCIETY FOR LIMNOLOGY

MINUTES of Executive Committee meeting held on Saturday, 18 November, 1978, at Caulfield Institute of Technology. The meeting opened at 2.30 p.m.

PRESENT I. Bayly (Chairman), J. Bell, J. Blyth, I. Campbell, A. Fletcher, P. Lake, J. Powling.

APOLOGIES: D. Buckmaster, B. Hart, L. Llewellyn, B. Mitchell.

1. Adoption of Agenda.

2. Minutes of Executive Meeting of 12th August, 1978.
The Minutes were adopted with minor amendment.

3. Matters arising from the minutes.

3.1 Organisation of 18th Annual Conference.

I.Campbell reported that confirmation of the booking had been received from the Tallangatta Sports Centre. Written quotations were being sought from the Tallangatta Travelodge Motel and the Tallangatta and Victoria hotels.

It was decided that a circular listing full conference details and costs should be circulated to members in the first week of March. In the meantime Ian Campbell undertook to obtain quotations for buses for the proposed Sunday BBQ.

3.2. J. Powling reported that little further organisation had been carried out on the proposed half day symposium for the 18th Congress.

3.3 Jolly Award to J. Lake.

3.3.1 Ian Campbell reported that a cheque had been sent to Nola Lake, to cover the cost of a copy of the Readers' Digest Complete Book of Australian Birds, and that the book plates for J. Lake and W. Williams should be ready within a week.

3.3.2 Ian Bayly reported on the progress in having a soapstone carving of a fish prepared as a presentation to Nola Lake. It was decided that a carving of a Scleropages would be appropriate. J. Bell volunteered to organise a specimen of Scleropages as a model for the sculptor. Ian Bayly volunteered to obtain the soapstone. It was agreed to offer the sculptor $50 for the work.

3.4 A number of proposed constitutional amendments suggested by D. Pollard were discussed. Some possible additional constitutional changes were suggested, to be referred back to D. Pollard, with the intention that a proposed revised constitution could be included in the next Newsletter and discussed at the AGM.

3.5 J. Bell reported that S. Rowlings was happy to act as ASL librarian.

3.6 Ian Campbell reported that the proceedings of the Symposium - "Aquatic Research in Southern Queensland" were being typed. Ian Bayly requested that the typescript be passed on to him for checking.

3.7 Ian Campbell reported that D. Lynch had resigned from the Jolly Award Committee and that J. Wharton was now chairman of that committee. A letter would be sent to W. Williams inviting him to join the committee.

4. Correspondence.

4.1 A letter had been received from the Victorian E.P.A. asking for a list of the ASL Project Aqua sites for Victoria.

4.2 Ian Bayly tabled a letter received from I. Hiscock, pointing out a number of irregularities to Special Publication No.2. The publication was undated, and the Society had not published a special Publication No.1. Bayly undertook to provide a full resumé of the points raised in the correspondence for the Newsletter. A listing of previous publications in the series was to be published inside the cover of Special Publication No. 3.

5. It was suggested that a list of new ASL members be published in each ASL Newsletter.

6. Financial Report

The balances of the accounts as at the end of October were as follows:-

General Account	$5,046.28
Publications Account	$1,754.92

with payments still to be made :

$186 to IPEC
$1,042.50 to CSIRO

Membership to end of October: 105 members were still unfinancial
20 new members
1 resignation.

About 139 members wished to receive AJMFR.

7. The date of the next meeting was set for SATURDAY, 24 FEBRUARY, 1979, at C.I.T.

8. Meeting closed at 4.50 p.m.

NEW 1978/1979 MEMBERS OF AUSTRALIAN SOCIETY FOR LIMNOLOGY

BAILEY Paul Charles	Dept Zoology, A.N.U., Canberra 2600
BARNES David	School of Civil Engineering, Univ. N.S.W., Kensington 2033
BREEN Peter	Elsie Grove, Mt. Evelyn 3796, or Water Studies Centre, Caulfield Institute of Technology.
BROWN Alan	Zoology Dept, Adelaide Univ., Adelaide 5000
BUSH L.J.	P.O. Box 85, Emerald 3782
CHRISTAN Chris	70 Bauduin Street, Forrest, A.C.T. 2603
CONRICK Dianne	142 Bluff Road, Black Rock 3193
CULLEN Peter W.	Sch. of Applied Science, Canberra College of Advanced Education, P.O. Box 1, Belconnon, A.C.T. 2616
DOEG Tim John	11 Wilson Street, Oakleigh 3166
FULTON Wayne	Inland Fisheries Commission, 127 Davey St, Hobart 7001
GRANT Thomas Ritchie	Zoology Dept, Univ. New South Wales, Kensington 2033
HAMMERTON Douglas Geoffrey	11 Balina Terrace, Vermont South 3133
HAND Raymond Malcolm	Antarctic Division, 508 St Kilda Road, Melbourne 3004
HEATH Colin	Metropolitan Water Sewage & Drainage Bd, P.O. Box 2 Guildford, N.S.W. 2161
IMBERGER Jörg	Univ. of W.A., Dept Civil Engineering, Nedlands 6009
McRAE Tom	Warrnambool Inst. for Advanced Education, P.O. Box 423 Warrnambool 3280
OBERTHUR Jeffrey	5 Stubley St, Wavell Heights, Queensland 4012
RANKIN Peter	22 Heather Grove, Cheltenham 3192
RAWLINGS Andrew	2/180 Mt Alexander Rd, Flemington 3031
ROWLAND Stuart	N.S.W. State Fisheries Inland Fisheries Res. Stn, P.O. Box 182, Narrandera, N.S.W. 2700
SPRY Mike	P.O. Box 408, Deniliquin 2710
YULE Cathy	5 Ormond College Grounds, Parkville 3052
MARINE SCIENCE Education Association	c/o W. Smith, Warrnambool I.A.F., P.O. Box 423 Warrnambool 3280
WARRNAMBOOL NORTH Technical School	Grafton Road, Warrnambool 3280
RADCLIFF SCIENCE LIBRARY (The Librarian)	Parks Road, Oxford OX1 3AP, U.K.
FISHERIES RESEARCH Laboratory	Ministry for Agriculture and Fisheries Private Bag, Christchurch, New Zealand

ABSTRACTS OF THESES

Abstracts are given below of M.Sc. theses by David Morton and Gary Davey. The theses were produced in the Department of Zoology, Monash University in 1977 under the supervision of Dr I.A.E. Bayly.

A REVISION OF THE AUSTRALIAN CYCLOPIDAE OF THE SUBFAMILIES CYCLOPINAE AND EUCYCLOPINAE (CRUSTACEA : COPEPODA)

by David W. Morton

The Australian Cyclopidae are revised. The number of species known from Australia is increased from 18 to 44; these are allocated to eleven genera. One genus and 16 species are described as new.

The species of the subfamilies Cyclopinae and Eucyclopinae are described and discussed and most are figured. Where known, the geographical distribution and general ecology of each species is indicated. Keys to the genera and species are provided.

The subfamilial classification of the family is discussed. A case is presented for the reduction of the number of subfamilies from four to two.

The zoogeographic affinities of the Australian Cyclopidae are briefly considered. The Australian fauna is interpreted as consisting of two broad groups: one derived from the Palaearctic-Oriental faunas, and the other a remnant of a previously widespread Gondwanaland fauna.

STUDIES ON ECOLOGICAL RELATIONSHIPS WITHIN A SALINE LAKE WITH SPECIAL REFERENCE TO ENERGETICS

by Gary Davey

Population numbers and standing crops of a community were studied over a year in a saline lake (T.D.S. 42-58 $^{o}/_{oo}$) situated 20 km S.W. of Melbourne, Victoria. Both water depth and temperature varied widely over the year. Three zones were identified in the lake: littoral algal zone (L.A.Z.), littoral algal free zone (L.A.F.Z.) and mid-lake zone (M.L.Z.). Collections were made at three-month intervals, from winter 1975 to winter 1976.

The L.A.Z. supported the highest population numbers and standing crops and the L.A.F.Z. the smallest. Numbers in the L.A.Z. ranged from 2-100 times those in the other zones. Algal biomass, and faunal numbers and biomass showed marked fluctuations in each zone. The maximum algal biomass of 24,600 mg/0.1 m^2 occurred in the L.A.Z. in spring. Algal levels in the other zones varied from 3-40 per cent of that in the L.A.Z. The biomass of Cladophora showed no significant correlations with any of the physico-chemical parameters. Animal numbers in the M.L.Z. were dependent on the presence of algae. Generally, in all zones, crustaceans were numerically dominant. However, when biomass is considered the gastropods, particularly Eubittium, were the major contributors usually comprising in excess of 90 per cent of the biomass of animals. Capitella, Allorchestes and Paracalliope were the other main biomass contributors in the lake. Annual mean biomass was 23.500 mg, 600 mg, and 1,500 mg for the L.A.Z., L.A.F.Z. and M.L.Z. respectively.

/There

There was an increase in species number in all zones following the period the lake was open to the sea. The L.A.Z. supported the highest species number and diversity and also showed the greatest constancy in species diversity.

It was concluded that the macroalgae played a vital role in supplying food for the gastropods and microhabitats for the majority of the faunal component as the highest numbers and biomass values were consistently recorded in the L.A.Z. Algae also make a significant contribution of organic material to the sedimentary layer.

The seasonal changes in number and standing crop were described for each animal species as were changes in the size frequency structure of the populations of Allorchestes, Paracalliope and Eubittium. Comments were made, where possible, on reproductive cycles and strategies and factors affecting population size and standing crop.

A modified Phillipson microbomb calorimeter was used to measure the caloric content (cals/gm) of the floral and faunal species and of the benthic sediments. The calorimeter was calibrated using benzoic acid and a regression equation relating the recorder deflection to calories was constructed. From these data caloric content and standing crops were calculated for each component. Tests were performed to measure the affects of formalin preservation on the caloric content of zooplankton and algae. The caloric level in algae decreased 5.7 per cent and that of zooplankton dropped 12.5 per cent over 30 weeks. This information was used to formulate regression equations and from these correction factors were calculated and applied to the data.

Changes in total caloric standing crop and the caloric standing crop of the individual species or species groups approximate those changes in biomass values recorded for the respective groups. The maximum total standing crop was 110,000 cals/0.1 m^2 in spring in the L.A.Z. with mean annual values of 49,260 cals/0.1 m^2, 960 cals/0.1 m^2 and 6,580 cals/0.1 m^2 for the L.A.Z., L.A.F.Z. and M.L.Z. respectively. The total algal and total faunal caloric standing crops were estimated for each zone.

Changes in the caloric content of the algae over the year indicated marked variations between these species; however the gastropods appeared to be responding to an "availability factor" rather than absolute food value. Caloric changes in the tissue of Cladophora seem to be due to density and not seasonal factors.

The relative contribution to total caloric standing crop by each of the major faunal groups in the L.A.Z. was very similar to the respective contribution in the L.A.F.Z. This lent further evidence to the conclusion that the population in the L.A.F.Z. was derived from emigration from the L.A.Z.

Seasonal changes in the caloric standing crop and caloric content of each species were measured and discussed. The overall variation in the caloric content of the fauna was 3,475-6,146 cals/gm, a range of 2,761 cals. The amphipods and Platycypris showed values towards the upper limits of the caloric levels. The results from the fish were comparable with the caloric levels in the majority of the invertebrates. Increases in the caloric content of Eubittium tissue followed increases in algal biomass in the L.A.Z.

The caloric content of different size classes of a number of species were measured and generally displayed an increase in caloric levels from small to large. The major components: crustacea, polychaeta and gastropoda, yielded a range of caloric content values which overlapped one-another.

/Finally

Finally, the diets of the faunal species were determined. Where possible, gut analyses were performed. In other cases a combination of aquaria observations, correlation tests and published material was used to construct a possible diet. Satiation tests and daily maintenance and metabolic requirements were measured for Taeniomembras.

It was clear that the majority of the invertebrates were primarily detritivores. A limited number were herbivores feeding either on phytoplankton, epiphytic- or macro-algae. The principal component of the diet of Taeniomembras was amphipods. The satiation biomass was between 0.90-1.17 per cent of the live weight of the fish. Daily maintenance and metabolic requirements were from 2.46 per cent to 2.72 per cent of the live body weight of the fish depending on the size of the fish. Larger fish required relatively less than did the smaller. The assimilation efficiency of Taeniomembras with Allorchestes was between 80 and 90 per cent depending on the size of the amphipod ingested.

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In 1978 in the Department of Zoology, Monash University, there were two honours students in limnology under the supervision of Dr P.S. Lake. The abstracts of these theses by Cathy Yule and Peter Rankin are reproduced below.

THE DISTRIBUTION OF MACROINVERTEBRATES AT A FRESHWATER CREEK/SALINE LAKE GRADIENT WITH RESPECT TO SALINITY

by Peter S. Rankin

The chemistry and biology, with respect to salinity, of Pirron Yallock Creek were investigated. This creek is unusual in that it is a system in which fresh water flows into a permanent saline lake.

Chemical conditions in the creek were largely determined by the degree of freshwater discharge over a blockade in the creek. The change-over from saline to freshwater conditions, which occurs regularly on an annual basis, initially results in salinity and temperature stratification in the creek and is followed by flooding which rapidly flushes the saline water out of the creek.

The fauna of the creek was shown to fall into four categories. These were: 1) freshwater taxa, 2) ubiquitous taxa, 3) saline water taxa, and 4) intermediate taxa. These categories were discussed on the basis of taxonomic groupings. At the community level three distinct communities were shown to occur. These were: (a) freshwater community, (b) intermediate saline community, and (c) saline lake community. The structure of these communities on the basis of similarity data and the changes induced by salinity were discussed.

The composition and standing crop of the benthos was discussed in relation to the benthos of other saline lakes and to the effects of salinity variation.

A spatial zonation pattern of the flora is found along the creek and is apparently correlated with salinity in the different regions of the creek. The intermediate saline section was shown to have a floral community dominated by Phragmites communis while the lake shore community was dominated by the hydrophyte Salicornia. Nitella, an alga, was confined to the saline region of the creek.

/Fourth abstract

FAUNA-SUBSTRATE RELATIONSHIPS IN A VICTORIAN COASTAL STREAM, WITH CONSIDERATION OF THE IMPACT OF DAM CONSTRUCTION

by Catherine M. Yule

The macroinvertebrate fauna of a Victorian coastal creek was sampled over a period of seven months. Samples of the fauna, together with substrate and water samples were taken prior to, and during, the construction of a dam on the creek. This was done to achieve the following aims:

1. To examine the fauna of a small discrete catchment system
2. To determine the influence of substrate type and the amount of plant detritus on the distribution and abundance of the fauna
3. To investigate the effects of the deposition of sediment eroded from the dam site on the substrate and fauna below the dam site.

The fauna of the creek was found to be very diverse with a total of 182 species recorded. In summer the fauna was dominated by the Trichoptera (36 per cent of the total fauna) and the Ephemeroptera (26 per cent). In winter the Plecoptera were very abundant, forming 27 per cent of the total fauna.

Of the most common species, 40 were found to be restricted to specific substrate types and a further 11 showed preferences for certain substrates. Cobbles generally supported the most diverse and abundant fauna of all the substrate types sampled. The Trichoptera, Plecoptera and Coleoptera were most abundant on cobbles whereas the Ephemeroptera showed a more general distribution.

Faunal abundance was correlated with the amount of detritus present on all substrates except the cobbles. Several species were found to be absent if no detritus was present. It seems likely that detritus is the major source of food in the creek since little algal growth was seen.

Erosion of the dam construction area, particularly during periods of high flow, resulted in high levels of turbidity and suspended solids as well as large deposits of sand below the dam site. Faunal abundance decreased significantly downstream from the construction area although the number of species present remained constant (except at the site immediately below the dam).

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The following Honours theses of limnological interest were produced in the Botany Department, Monash University:

1976. CLARK, R.L. Vegetation history and the influence of the sea at Lashmar's Lagoon, Kangaroo Island, South Australia - 3000 B.P. to the present day.

1977. BREEN, P.F. Environmental factors influencing assimilation rates and the resulting productivity of Hydrocotyle verticillata Thumb and Fissidens regidulus Hook F. & Wils. at Ewen Ponds.

TUOHY, M.A. Heterophylly in water plants.

BOOK REVIEWS

"AN INTRODUCTION TO THE AQUATIC INSECTS OF NORTH AMERICA"
Edited by R.W. Merritt and K.W. Gummins, Kendall-Hunt Publishing Co.
441 pp. 1978. US$19.50.

Reviewed by Ian Campbell

North American limnologists have been blessed by a series of excellent texts and identification guides to their freshwater fauna, particularly the freshwater insects. No doubt this is a reflection of the greater depth to which their fauna is known, both taxonomically and ecologically, as well as the size of the potential market for such books in the U.S.

Aquatic Insects of North America follows the pattern originally set by Ward and Whipple, and followed by Usinger (1956), of a series of chapters on the various taxonomic groups by specialist authors.

The introductory chapters include a chapter on the morphology of aquatic insects, somewhat simpler than the chapters on insect anatomy in CSIRO, and a valuable chapter on collecting, sampling and rearing methods. This chapter summarises, in tabular form, techniques and equipment most suitable for sampling various aquatic habitats with illustrations of many common and less common items of invertebrate sampling hardware. There are also chapters on the ecology and distribution of aquatic insects, and on their phylogenetic relationships and adaptations.

The rest of the text deals with specific groups of insects with, for the most part, a chapter devoted to each order. However, the megalopterans and aquatic neuropterans are lumped together, and the Diptera are not only discussed as a whole but additional chapters cover the tipulids, culicids, simulids and chironomids separately. Both the adult and immature stages are discussed in each group. Most chapters have keys only to the level of family, but the dipteran chapters give keys to the generic level.

A valuable innovation in the systematic chapters is a tabular summary in each chapter of ecological information on the particular group. Each table lists known genera within the order or family and summarises the number of species, the habitat, habits, tropic relationships and North American distribution of the genus, with a list of references to ecological studies of members of the genus. As such the book would prove quite valuable as a source of information on species referred to in the North American literature.

The book is extremely well produced, hard-bound with a striking cover, and well laid out with an abundance of large, clear line diagrams. Tables are well used throughout. The book can be purchased direct from the publisher:

Kendall-Hunt Publishing Co.
2460 Kerper Boulevard
Dubuque, Iowa 52001
U.S.A.

The introductory chapters alone are well worth the cost of US$19.50.

"AUSTRALIAN FRESHWATER FISHES - AN ILLUSTRATED FIELD GUIDE"
By John S. Lake. Thomas Nelson (Aust.) Pty Ltd, Melbourne.
160 pp. 1978. A$7.95.

Reviewed by P.L. Cadwallader

This book is part of the Nelson Field Guide series and has a completely different format from John Lake's first book "Freshwater Fishes and Rivers of Australia" published by Nelson in 1971. It is reasonably priced at $7.95 and is a handy size for a field guide (page size 13 cm x 18.5 cm). However, it is a paperback and I do not think it will stand up too well to the rigours of field work. Perhaps for the price I might have expected to get a hardback! I would prefer to see field guides with hard covers and with pages made of wettable, non-tear paper of the type used in Scott et al's (1974) "The Marine and Freshwater Fishes of South Australia". Cost must of necessity be borne in mind in these considerations, but nevertheless a field guide should be made to withstand field conditions.

In the introduction the book is described as being designed to fill the need for a "simple field guide". It is mentioned that since the publication of John Lake's first book there have been a number of studies, mainly taxonomic, on Australian freshwater fish. Since the book is dealing with a relatively small number of species (144) and the fish in the various families are relatively distinct, it is argued that there is no need for "complicated keys". However, I was unable to find even any "simple keys" to distinguish between, for example, the various galaxiid species. There is some discussion on the point that arises in many books on freshwater fish and that is where to draw the line on those species which are essentially marine but which enter fresh water. There follow short comments on the potential of native species as aquarium fish, the inherent ecological and disease dangers posed by exotic aquarium fish, and the present state of aquaculture in Australia. A classification of the vertebrates is then presented. Of the jawless fish there are three species (all lampreys) which occur in fresh water in Australia (but these receive no further mention in the book!). Of the cartilaginous fish, two species, the river whaler shark Carcharhinus leucas (Family Carcharhinidae) and the freshwater sawfish Pristic microdon (Family Pristidae), are included in the book, the rest of the species being bony fish.

After the Introduction, notes on the thirty-one families of native fish (including the two cartilaginous fishes) are presented, followed by notes on the four families of introduced fish. All the illustrations are in one section at the back of the book and with three or four exceptions follow the text sequence of species. Between the main body of the text and the illustrations there is a list of "fishes which regularly and commonly enter fresh water and which are not illustrated or detailed in the notes". This list includes mainly marine species which enter fresh water, as well as the blind eel Ophisternon candidum (Family Synbranchidae) and blind gudgeon Milyeringa veritas (Family Eleotridae) both of which occur in subterranean waters of North-West Cape in Western Australia, and Blanchard's perchlet Glossamia aprion blanchardi (Family Apogonidae) which has been reported from the Barron River near Cairns. There is also an index of common names, an index of scientific names and three blank for the reader's own notes.

In the text the family, scientific and common names of each species are given, together with the page number on which a photograph of the species occurs. Notes are given under the headings of "distribution", "breeding", "food" and "comment", the last including details of such things as edible and sporting qualities. Some general comments on the family are sometimes given. The

/amount

amount of information given under each heading varies considerably and accentuates the paucity of knowledge on some species, e.g. inland chanda perch Ambassis castelnaui (p. 44), the perchlets Ambassis spp. (pp. 44 and 45) and nightfish Bostockia porosa (p. 46). Each double page of text has in the bottom left hand corner a small map of Australia divided into twelve numbered drainage divisions. Numbers given under the "distribution" notes refer to these numbered drainage divisions and are the means by which the distributions of the various species are indicated. The use of such a scheme is probably the most effective way of tackling the problem of fish distribution on an Australia-wide basis. In some distribution notes various place names are mentioned in addition to the drainage division numbers, but, unfortunately, not all these names are given in the more detailed map of Australia to be found on the end papers of the book.

Any attempt at outlining the distribution of fish on an Australia-wide basis will inevitably draw modification from sources of local knowledge. As additions to the distribution data mentioned in the book it might be added that the range of the herring Potamolosa richmondia (p. 15) extends around the coast to the Glenelg and Wannon Rivers in Victoria (Barnham 1978), that introduced tench Tinca tinca (p. 80) occur in drainage division 2 in Victoria, e.g. in the Maribyrnong River (Tunbridge and Rogan 1976), and that introduced roach Rutilus rutilus (p. 81) have been found in Lake Eildon, Victoria, in drainage division 4, the Murray-Darling system (Cadwallader and Rogan 1977).

There is little new nontaxonomic information presented in this book compared with John Lake's earlier volume, but the reader is brought up to date with the latest specific names proposed in recent or ongoing overhauls of the Percichthyidae, Galaxiidae, Plotosidae, Teraponidae and Electridae. Amongst other changes the reader will learn that the old familiar Plectroplites ambiguus for yellow belly or golden perch has now been replaced by Macquaria ambigua. In addition to the Galaxiidae mentioned in the book, McDowall and Fulton have recently (1978) described a new species, Paragalaxias julianus, making four species of Paragalaxias recorded from Tasmania.

I found the number of "half-way" comments in the text very frustrating. For example, on page 42 when describing the Dalhousie hardyhead Craterocephalus dalhousiensis it is said that "The sexes can be readily distinguished by external shape", but there is no description of the different shapes; on page 43 the larvae of giant perch or silver barramundi Lates calcarifer are said to be "quick hatching", but there is no mention of the actual time they take to hatch, and on page 64 it is mentioned that the silver batfish Monodactylus argenteus "alters in colour and shape as it grows", but there is no mention of the actual colours or shapes! In addition I would not regard shrimps and earthworms as sedentary organisms as implied by the comment (p. 60) that small-headed grunters Scortum parviceps when kept in aquaria spend most of their time on the bottom "feeding on sedentary organisms such as shrimps, earthworms and some plant material". The description of the mud galaxias Galaxias cleaveri (p. 20) having a "dark blue-grey, unpigmented stripe" seems contradictory, and the comment (p. 81) for roach that "like all other species in the carp family introduced to Australia, these have nothing to offer" appears to contradict the statement on the previous page that selectively bred European carp Cyprinus carpio "cooked with expertise are good eating".

The comments on introduced rainbow trout Salmo gairdneri (pp. 77 and 78) are worth repeating:

> "Considered an excellent sport fish on light gear and will take most artificial lures. Many native species provide just as

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> good sport if similar light gear is used. Overrated as an edible fish; many native fishes far superior. Its overrated qualities go back to the time when trout-fishing was mainly confined to the rich, and some sort of snob appeal still lingers. Ignorance of the native fishes was, and still is to some extent, another reason for the attitude towards trout.
>
> "The extensive and common practice of stocking artificially reared trout has been shown by research, over and over again, to be in most instances unnecessary, wasteful and possibly harmful to the naturally bred trout."

Certainly this book helps to remedy our ignorance of Australian native fish. Unlike many earlier texts on Australian freshwater fish which devoted many pages to introduced salmonids, the brown trout Salmo trutta is dismissed in only three lines (p. 78) because it "is similar to rainbow trout in most general respects". In the treatment of other introduced species mention is made of the deleterious effects of salmonids on galaxiids (cf. John Lake's earlier comments on the effects of trout on native fish in Weatherley and Lake (1967) p. 236), and of the adverse effects of European carp and mosquito fish Gambusia affinis. Redfin or European perch Perca fluviatilis are considered to be "one of the more acceptable introduced fishes although blamed by some for a reduction in native species".

Although European carp and goldfish Carassius auratus are included in the book, there is no mention of the crucian carp Carassius carassius or, perhaps more significantly, no explanation of why it was excluded. This is interesting because C. carassius is mentioned in all John Lake's earlier general texts, e.g. see Lake 1959, 1967, 1971, 1975, Weatherley and Lake 1967. Certainly there has been some misidentification of crucian carp and wild goldfish in the past and all the Carassius I have examined in Australia, including some from waters which were supposed to contain crucian carp, have keyed out to C. auratus not C. carassius. I canvassed the opinion of colleagues in the Victorian Fisheries and Wildlife Division, New South Wales State Fisheries and the Australian Museum as to the status of crucian carp in Australia. The general consensus was that there had indeed been much confusion of crucian carp with wild goldfish in the past and that because of this confusion crucian carp are probably much less widespread than had previously been thought. However, there are reliable records of C. carassius occurring in Australia, so the species should have been included in the book.

The illustrations occupy pages 97-160 and, according to the details given on the back cover, consist of 136 colour photographs and 13 black-and-white photographs and drawings. With one exception (a photograph of a pair of McCulloch's rainbow fish Nematocentris maccullochi which has a page to itself) the photographs are arranged two or three to a page. Beneath each photograph are the common and scientific names of the fish, the page number where the relevant text can be found and the approximate maximum length recorded for the species. For the larger fish an approximate maximum weight is also indicated. The initials of the photographer or artist are also given (full names are in the Acknowledgements at the front of the book). The book contains the first published photographs of many species and also contains photographs of some as-yet-undescribed species, e.g. the grunters or terapon perches on pages 134 and 135. The quality of the photographs ranges from excellent to very poor. Those taken by the aquarist Gunther Schmida understandably get special mention and, as pointed out in the Acknowledgements, his photographs rank amongst the finest Australian freshwater fish photographs available. On the other hand, some photographs, such as that of the out-of-focus purple spotted gudgeon Mogurnda adspersa (p. 151) are very poor, and photographs of partially

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dried out dead fish (e.g. Cox's gudgeon Gobiomorphus coxii p. 152; desert goby Chlamydogobius eremius p. 153) and dead fish supported on "rectal rods" (the Neosilurus spp. on pp. 113 and 115) look out of place amongst the far superior aquarium photographs of live fish. It is a pity too that a colour photograph of the dwarf galaxias Galaxiella pusilla could not be obtained since this diminutive fish must be the most brightly coloured galaxiid in Australia. It certainly is not seen to its best advantage in black and white. In addition, readers might be forgiven for thinking that every galaxiid infected with blackspot is a Clarence galaxias Galaxias johnstoni (p. 104) or that every galaxiid with a deformed vertebral column is a flat-headed galaxias Galaxias rostratus (p. 105)! While on the subject of photographs the gaudy front cover of the book features the superimposition of colour photographs of a carp gudgeon Hypseleotris compressus and a freshwater mullet Trachystoma petardi on a background of a giant perchlet Parambassis gulliveri, with little regard being given to the relative sizes of the species depicted. The photographs of each species are taken from those used within the book, but I would have thought that there are a sufficient number of very good photographs in the book to have chosen one to stand by itself on the front cover.

There is no reference list or bibliography in the book and comments such as "described by Bob McDowall and Wayne Fulton in 1978" (p. 28) are of little use to the angler who is not acquainted with these two gentlemen!

Although serious students of Australian freshwater fish may be familiar with the literature, I think a short, selected bibliography would have been very useful to the interested layman.

Overall I was disappointed with the book. As a field guide it falls short in not stressing or even describing those features which distinguish closely related species from each other, features which may not necessarily be obvious from the photographs. Keys are probably not necessary to distinguish between the various families since, as mentioned in the Introduction, the fish in each family are relatively distinct, and a browse through the photographs will probably take the reader to the right family. However, from here the task becomes difficult if there are a few species in the family. I would have preferred to see some simple intra-familial keys based on external features or even a text heading "distinguishing features" which, without giving a formal description, would list those features unique to each species or those features which help to distinguish a species from its physically-similar relatives. Such a scheme would be particularly useful in distinguishing, for example, between Murray cod and trout cod and between the various galaxiid species. However, despite its shortcomings, the book is a welcome addition to the meagre literature on Australian freshwater fish.

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/McDowall

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"TASMANIAN ODONATA"

By Piers Allbrook. Fauna of Tasmania Committee, University of Tasmania, 1979. Fauna of Tasmania Handbook No. I. Price $2.00 ($2.50 by post).

Reviewed by P.S. Lake

Many ornithologists behold birds of prey in great respect and wonder, for many entomologists and freshwater biologists adult odonatans are the birds of prey of the insect world. A swarm of chironomids is noticed, a hatch of mayflies arouses considerable interest, but the sight of a flight of darting dragonflies is sheer delight. This delight has no doubt been experienced by the author of "Tasmanian Odonata".

The handbook "Tasmanian Odonata" is a fine beginning to a projected series of handbooks on the fauna of Tasmania. (Handbook No. 2 is entitled "Tasmanian Bird Atlas".) As Tasmania is a distinct biogeographical entity and because many elements of its fauna have attracted considerable taxonomic attention, the production of a series of handbooks on the fauna is a well warranted project. The production of regional faunal handbooks would be much more difficult to realize in mainland Australia where State boundaries are not biogeographical boundaries and where regional faunas may be uncertain sub-samples of a widespread continental fauna.

The handbook is well organized. It begins with a succinct introduction to the major features of the Odonata which is followed by most useful instructions on the collection and preservation of odonatans. Next there is a check-list and then a detailed account with explicit diagrams on the taxonomic features of nymphal and adult odonatans. The major part of the handbook is occupied by a key to the nymphs and then a key to the adults of Tasmanian odonatans. Speaking as a limnologist it is most gratifying and useful to see the nymphs accorded proper treatment. Previous works on Australian odonatans (e.g. Fraser 1960) have neglected the nymphal stages. The keys (at least for the nymphs) work well; although in the Corduliidae the separation of Hemicordulia tau from Procordulia jacksoniensis is difficult - especially for the reviewer working through collections from the Serpentine impoundment where both species occur.

For each species a distribution map is provided. This situation is possibly carried to an extreme whereby the distribution of Agriocnemis pygmaea in Tasmania is indicated by a large question mark. It may have been better to say simply that this species has been recorded as being in Tasmania by F.C. Fraser (1960) but no localities were given and it has not been collected in Tasmania subsequently.

/The printing

The printing of the handbook is remarkably errorless; on page 14 peculiar is spelt phonetically and on page 30 absent is mis-spelt. The many diagrams are of a high quality and illustrate the keys very well. On page 13, in describing the system adopted for the nomenclature of the wing veins, it is stated that the system adopted "closely follows that used by Tillyard and Fraser (1957)". I assume that the reference to Tillyard is either to his 1917 or 1926 book while the reference to F.C. Fraser is not indicated in the list of references. The work of F.C. Fraser referred to is presumably F.C. Fraser (1957) "A Reclassification of the Order Odonata".

The odonatan fauna of Tasmania only consists of 27 species of the present Australian tally of 269. There are five endemic species. The handbook provides keys to both nymphs and adults and consequently will be of considerable use not only to aquatic biologists and entomologists in Tasmania but also to those in south-eastern Australia.

The book is, I think, fairly priced and constitutes a valuable addition to private and institutional libraries haunted by limnologists and entomologists.

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"ON THE NATURE OF RIVERS WITH CASE STORIES OF NILE, ZAIRE AND AMAZON"
By J. Rzoska, Dr. W. Junk, b.v. Publishers, The Hague, 1978. $US10.25.

The intention of this booklet is difficult to determine but it appears to be an attempt to outline the essential features (physical, chemical and biological) of rivers notably their lowland sections. The author is particularly concerned at the neglect of limnological consideration of the lowland sections (the depositional sections or potamons) of large rivers at the expense of the consideration given to the upland sections of rivers. However in seeking a limnological re-evaluation of the lowland sections of rivers I think that the author is not very successful.

Part I. of the book, entitled the "Essential Features of Rivers", attempts to outline the essential features by the use of three case studies or "case stories" as they are rather ambiguously called. The Nile, the Zaire and the Amazon are treated in most brief accounts which cover their origin, geology, morphology, water regime, climate and plant cover of the river valley, limnology and biology, human presence, exploration and human pressure. The case study of the Nile is in effect a brief summary of the much more salutary treatment of "The Nile. Biology of an Ancient River" (J. Rzoska, ed., 1976), while the case studies of the Zaire and the Amazon are very brief accounts of very poorly known systems. Why was the Zaire of all rivers chosen for a case study when knowledge of its essential features is so poor? Rzoska is indeed right when he writes "the limnology of the Zaire system is not known adequately". The discussions of the Zaire and the Amazon for that matter because of the paucity of knowledge and the imprecision of much that is known do not serve to examplify soundly the essential features of large rivers. Why not use large rivers like the Danube, the Volga, the Rhine, the Thames, the Mississippi, for which there are considerable amounts of reliable information?

As Rzoska is concerned with the neglect of lowland sections of rivers it may have been much more instructive to compare the known attributes of upland and lowland sections of rivers using many examples rather than use three "case stories" with two poorly known rivers. The second part of the essay is entitled "General and Polemical Reflections on the Nature of Rivers". The author quite rightly points out that the lowland sections of rivers have been neglected by limnologists in comparison to the upland Rhithron sections. (Rhithron is repeatedly mis-spelt as "rhitron"). In discussing the biological features of lowland potamon sections, zooplankton is the only community or assemblage discussed in any length. Fish and benthos of lowland rivers, on which there have been a large amount of studies (for various motives) are completely neglected in Rzoska's polemic and thus any indication of the interrelationships of the biotic components of lowland rivers is not given - an important omission if one is talking about ecosystems. For the student of rivers (the lotologist as compared to the limnologist) the case studies contribute little to an understanding of rivers.

Rzoska questions the application of the ecosystem concept to rivers and concludes that rivers do not conform to any current definition of ecosystems. In a pedantic sense he is right but he neglects *in toto* the tremendous value that the ecosystem concept (however shakey its foundations may be) has had for those working on the movement of energy and nutrients in lotic systems. There is no mention of energy utilization and energy pathways in Rzoska's discussion of rivers - no mention of the work of K.W. Cummins, G. Likens, C.D. McIntire etc. The ecosystem concept as applied to rivers is rejected but an essential ingredient of the ecosystem concept is not discussed. The discoveries of the importance of organic matter input and of detritus processing in lotic systems have been, in my opinion, very important breakthroughs for our current understanding of lotic systems. Possibly in the future, models of lotic system energetics such as that of McIntire, C.D. and J.A. Colby (1978) (Ecol. Monogr. 48:167-190) derived from work on small streams could be derived for the wide lowland sections of rivers. A comparison between two such models may be most fruitful (Do they both export energy? How important is photosynthesis in the lowland sections?)

The essay is abundantly illustrated with the ERTS photos of the Nile being starkly explicit. Unfortunately the book contains a considerable amount of spelling errors, some most awkward pieces of expression (e.g., "He says that not all what floats in a running water is plankton" p.53) and some references cited in the text are not given in the list of references.

The book may serve to stimulate limnologists to pay more attention to lotic systems especially voluminous lotic systems. The essay does not, however, in my opinion, serve to further our understanding of rivers though it may induce a stock-taking of our knowledge of lotic systems and hopefully it may serve to stimulate efforts to fill some of the immense gaps in current knowledge of rivers.

HAZARDS OF THE AUSTRALIAN AQUARIUM FISH INDUSTRY

Recently in the newspapers several items relating to the aquarium fish industry have been reported. The Age of January 31, 1979, under the headline of Fish Land Companies in Court reported that two aquarium companies were placed on good behaviour bonds over noxious fish. The companies faced charges for importing and keeping Texas cichlids. In defence one of the salesmen said that he had not ordered the Texas cichlids but that they must have been included in the order from Singapore as a replacement for other fish. Piranhas for goldfish!

Under the headline 'Walking Catfish a Hazard to Wildlife', The Australian of Feb. 10-11, 1979, reported on the evidence of J.C. Wharton, Director of Fisheries and Wildlife, Victorian Ministry of Conservation and of Mr. R. McKenzie, President of the Australian Freshwater Fishermen's Association to the Senate National Resources Committee. To the committee, Mr. Wharton said that piranhas were readily available under the counter in Melbourne for $3 each, while Mr. McKenzie reported an incident when 123 small freshwater moray eels were found in a pet shop. Apparently the importer did not know what they were, but in the box from overseas was a note "I sent these to prove how easy it is to get through Australian customs".

Some ASL members may know of the sound report written by R.J. Mackay (Queensland Museum) entitled The Australian Aquarium Fish Industry and the possibility of the Introduction of Exotic Fish Species and Diseases. It was produced as Fisheries Paper No. 25, Fisheries Division, Department of Primary Industry, Canberra 1977. As the recommendations of this paper may be of considerable interest to many A.S.L. members, I have taken the liberty of reproducing the recommendations with the kind permission of the author.

RECOMMENDATIONS

1. That the number of *exotic* species permitted for importation be reduced to approximately 100 species, and that this list be reviewed annually after consultation with the trade.

It is not reasonable to expect a trained officer to identify more than approximately 100 species at the port of entry; a list of 100 species would greatly simplify identification.

The list of 100 would include almost all the popular aquarium fishes now imported regularly by the trade with the exception of those species that:

- have caused problems when introduced anywhere in the world;
- might have detrimental effects on other species of fish;
- might have detrimental effects on the environment;
- were known carriers for any economically important disease believed not to be in Australia;
- were harmful to man or livestock;
- had a wide capacity for survival and dispersal; and
- might readily be confused with undesirable species.

A reduction of the number of species of live fishes approved for importation from approximately 700 species to approximately 100 popular species that have had a long relatively trouble-free history with the aquarium trade in Australia seems to be a reasonable compromise that would permit research on the diseases, behaviour and environmental risk of a limited number of species whilst permitting the aquarium trade to freely import most of the aquarium fishes necessary for the continuation of the trade. All other fishes would revert to the status of being prohibited until they could be adjudged safe for importation.

Maintaining a list of 'approved' fishes and with regular consultation with the aquarium trade would reduce the risk of introducing undesirable predatory fishes or those species regarded as 'non-community' fishes by the aquarium trade. Such species are currently imported in small numbers for sale to the aquarist seeking unusual species but due to their aggressive nature these fishes are not popular with most hobbyists.

Continued research, and consultation with the aquarium trade, is necessary to safeguard the interests of the aquarium trade, the hobbyist, and the environment.

2. That a system allowing Customs officers to accurately identify imported exotic fishes permitted under (1) above be provided. A training programme be commenced to further the knowledge and skills of such officers.

Customs officers are not trained to recognise imported aquarium fishes. Some officers have become very proficient in identifying the commonly imported species, but are unable to assign the uncommon species to an order, family or genus, much less a species. For 700 species in 170 genera the expertise required to identify the now permitted species is unreasonable; the task of identifying all the freshwater aquarium species that may appear in importers' consignments is clearly beyond any professional ichthyologist and would require the skills of a number of specialist systematists engaged in full time study on the various families of fishes.

3. That each importer be issued with a licence or permit, and that such licence or permit be subject to suspension or revocation on any irresponsible action by the licensee.

Many aquarium dealers welcome the suggestion of a licensing system and are prepared to pay for such a licence as they feel that this control is necessary and desirable. The fee for an import licence would, in their opinion, discourage the backyard importer and thus stabilize the industry to some extent.

4. That a list of prohibited or noxious fishes (dangerous, harmful or undesirable fishes) be prepared and that:

   (a) No person shall keep, hatch, rear or consign any prohibited fishes without prior written consent of the Minister of of Fisheries in that State.

   (b) No person shall release, or cause to be released, any live fishes into State waters without prior written consent of the Minister of Fisheries in that State.

Although the list of 100 species would preclude the possibility of many undesirable fishes entering Australia, stocks of exotic fishes entering Australia, stocks of exotic fishes such as Tilapia, Macropodus, Leiocassis, Mystus, Microglanis, Pimelodella, Astronotus, and some Cichlasoma species are within Australia at present and may continue to be bred locally.

5. That fish farms or any commercial undertaking to breed exotic fishes be licensed and that the location, means of confinement, disposal of wastes, and treatment of disease be open to inspection and control by the Director of Fisheries in that State.

Most of the undesirable exotic fish introduction to Florida, U.S.A. have resulted from escapes or release from aquarium fish farms.

6. That research facilities be provided for the regular sampling of all fishes permitted for importation, and that a trained staff of parasitologists, bacteriologists, virologists and fisheries biologists be employed to carry out investigation and research on the following:

   (a) parasites and disease of native and imported fishes,

   (b) the survival potential of live fish species imported under permit, and their possible effects on native freshwater fishes and their habitats, and

   (c) outbreaks of disease in fish hatcheries, fish farms or aquarium retail establishments.

Research into the problem of large scale importing of exotic fishes is urgently required. Some monitoring of the diseases associated with exotic freshwater aquarium fishes is being carried out in the U.S.A.; similar work should be started in Australia. The survey of the diseases and parasites of exotic fishes would be greatly facilitated by reducing the number of species permitted for import. If the initial list of 100 exotic fish species is proved to be of 'low risk' and free of diseases and parasites that are not already present in Australian waters, the number of species could be gradually increased to the capacity of the identification system provided by Customs officers or trained ichthylogists.

Financial support from the aquarium trade may be obtained from import licence fees or a surcharge on all imported fishes or both in addition to government support for facilities and staffing. Such facilities would assist the aquarium fish importers and breeders, and government agencies involved with the introduction and establishment of game and food fishes. The research would provide a secure foundation for the development of aquaculture in Australia.

CONSTITUTION

The Executive Committee of the Australian Society for Limnology at a meeting on 18 November 1978 considered a revised version of the Society's Constitution. It recommended adoption of the revised constitution at the next Annual General Meeting of the Society (20 May at Tallangatta).

Under Section 13 of the Constitution "at least two weeks' notice shall be given to all members by the Executive Committee of any proposed change to the Constitution". Accordingly the new Constitution is reproduced below. The Executive Committee would like to thank Dr D.J. Pollard for his help in revising the Constitution.

THE AUSTRALIAN SOCIETY FOR LIMNOLOGY CONSTITUTION

1. NAME

The name of the Society shall be the Australian Society for Limnology.

2. OBJECTIVES

The objectives of the Society shall be to establish effective liaison between persons interested in any aspect of fresh and brackish water research in Australia and to encourage these interests and promote their study in State and Commonwealth Research Institutes and Departments, and Educational Institutions.

3. MEANS OF ATTAINING OBJECTIVES:

The following means may be used to attain the objectives of the Society:

(a) The establishment and maintenance of a register of all persons working in fields relevant to Limnology in Australia and adjoining countries, giving details of their current interests.

(b) The holding of an Annual Congress which will coincide with the Annual General Meeting.

(c) The production of a Newsletter (which shall be distributed to all Financial Members and all Honorary and Sustaining Members) by an Editor to be appointed by the Executive Committee.

(d) The publication of any scientific or other information relevant to the objectives of the Society. Scientific material shall, before publication by the Society, be considered and approved by an Editorial Board of at least two members appointed annually by the Executive Committee.

(e) The encouragement of interest in Limnology and support for the Society by the granting of Awards and by recognition of supporters through special categories of membership.

4. MEMBERSHIP

(a) The members of the Society shall be:

(i) Ordinary Members who shall be persons admitted to membership by the Executive Committee, who shall pay such annual subscriptions as shall be fixed from time to time.

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(ii) Student Members who shall be university undergraduates or scholars at any educational institution, who shall pay such annual subscription as shall be fixed from time to time.

(iii) Honorary Members who may be elected for a limited specific period by the Executive Committee.

(iv) Honorary Life Members who may be appointed at an Annual General Meeting on the recommendation of the Executive Committee.

(v) Sustaining Members who may be individuals, companies or organisations, admitted as such, by the Executive Committee, in accordance with the following requirements, and have the privileges indicated below:

(i) Any individual, company or organisation contributing the sum of $50.00 or more in any one year shall be eligible for admission as a Sustaining Member.

(ii) Sustaining Members who are companies or organisations shall have the right to nominate two persons who shall enjoy all the privileges of Ordinary Members, including the right to vote, but not to hold office, while Sustaining Membership is current.

(iii) Sustaining Members shall be acknowledged in all official publications of the society for a period of twelve months from the date of their contribution, and in any other manner as the Executive Committee may from time to time decide.

(vi) The Executive Committee may, in its absolute discretion, refuse admittance to any classification of membership, and shall be under no obligation to give any reason for its decision not to accept any candidate for membership.

(b) Affiliated Bodies, Incorporated or Unincorporated Bodies and other organisations approved by the Committee may become affiliated with the Society on acceptance by the Executive Committee and on payment of such annual subscription as may be fixed from time to time.

(c) A register of Members and Affiliated Bodies shall be kept by the Secretary-Treasurer.

5. VOTING

Each Ordinary and Student Member and each of the nominees of Sustaining Members shall be entitled to one vote at a General Meeting or in a postal ballot and each Affiliated Body shall have the right to appoint a delegate who shall be entitled to one vote at a General Meeting or in a postal ballot. Honorary Members shall not have the right to vote. All votes shall be cast personally and not by proxy.

6. ANNUAL SUBSCRIPTION

The Annual Subscription shall be due on 1 July in each year and the amount shall be fixed at the preceding Annual General Meeting. Members whose subscriptions are not paid by the succeeding 31 December shall be unfinancial and shall forfeit all rights and privileges of Membership forthwith.

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7. RIGHTS OF MEMBERS

All financial members are entitled to receive current issues of the Society's Newsletter, scientific and other publications free of charge, and to attend all general meetings of the Society.

8. MANAGEMENT

The Society shall be managed by an Executive Committee consisting of the President, the immediate Past President (ex officio), the Vice President and the Secretary-Treasurer, together with not less than five and no more than eight other Committee Members, all of whom shall be elected at the Annual General Meeting. This Executive Committee shall implement the Society's general business, and a simple majority shall decide all questions at Executive Committee Meetings. If voting is equal, a motion is lost. A quorum at Executive Committee Meetings shall be four.

9. FINANCE

The financial year of the Society shall cover the period from 1 May in any year to 30 April in the next ensuing year.

(a) All funds received by the Society shall be banked in the name of the Society. Separate accounts may be established for specific purposes at the discretion of the Executive Committee.

(b) All bills or accounts shall be certified as to their correctness by the Secretary/Treasurer, and shall be paid by cheque. All cheques shall be signed by any two of the President, Vice President and Secretary/Treasurer.

(c) No bill or account shall be paid without the prior approval of the Executive Committee, which approval may be obtained at a meeting of the Committee or by mail, Expenditure of a general nature may be approved in advance during any one financial year. Any commitment to expenditure entered into by the Executive Committee which has not been paid by the date of the Annual General Meeting shall be drawn to the attention of the Annual General Meeting in the Financial Statement together with any amounts owing to the Society.

10. GENERAL MEETINGS OF THE SOCIETY

The A.G.M. shall determine the date and place for the next Annual General Meeting. A Special General Meeting may be called at the discretion of the Executive Committee and shall be summoned as soon as practicable following receipt of a request to do so signed by not less than twenty (20) members entitled to vote. Special General Meetings shall be called by notice in writing, specifying the business to be considered, and notices must be posted to all financial Members not less than fourteen (14) days prior to the proposed date. No business shall be conducted at any Special General Meeting other than that specified in the notice convening the Meeting.

11. QUORUM FOR GENERAL MEETING

At all General Meetings, twenty (20) members entitled to vote shall constitute a quorum, and a simple majority shall carry a motion.

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12. ANNUAL REPORTS

An Annual Report and Financial Statement shall be submitted to the Annual General Meeting, and the Financial Statement shall be audited by a person appointed at the previous Annual General Meeting. In the event that the Annual General Meeting is held prior to the end of the financial year, a separate Financial Statement covering the period of the financial year shall be prepared by the Secretary/Treasurer and the Auditor shall certify as to its correctness. Such audited report shall then be published in the Newsletter, or otherwise distributed to members as soon as practicable after the close of the financial year.

13. AMENDMENTS TO THE CONSTITUTION

Amendments may be made to the Constitution of the Society at an Annual General Meeting, or at a Special General Meeting, or by a postal vote. Any proposed amendments shall be submitted in writing over the signature of any two members to the Executive Committee which shall either

(a) refer them for consideration at the next ensuing Annual General Meeting, or

(b) call a Special General Meeting, for the purpose of considering the proposed amendments, or

(c) conduct a postal ballot of all financial members

A proposed amendment shall be carried by a two-thirds majority of votes polled. At least two weeks' notice shall be given to all members by the Executive Committee of any proposed change to the Constitution.

14. WINDING-UP OF SOCIETY

The Society shall not be wound up except (a) on a two-thirds vote in favour of doing so at an Annual General Meeting or a Special General Meeting called for this purpose, and in either case at least two weeks' notice of the proposal shall have been given to all financial members, or (b) in the event of membership being less than five persons. The last General Meeting shall decide how the assets of the Society shall be disposed of but this must be done in accordance with the aims of the Society and Individual Members shall not receive any benefit.

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Outline of the changes to the Constitution

Apart from minor changes in spelling and punctuation, the major changes proposed are:

(a) In paragraph 2, the Objectives of the Society are reworded. There is no change in the substance of the Objectives of the Society.

(b) In paragraph 3, part (a), the words "and relevant publications" are deleted, after "their current interests".

(c) In paragraph 5, "Voting" - student members are given voting rights.

(d) In paragraph 9, part (a), reference to "A Publication Fund" is deleted.